Abstract View

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Internal Waves in the Arctic Ocean: Comparison with Lower-Latitude Observations

Murray D. Levine and Clayton A. Paulson

College of Oceanography, Oregon State University, Corvallis, OR 97331

James H. Morison

Polar Science Center, University of Washington, Seattle, WA 98195

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ABSTRACT

A thermistor chain was moored below the pack ice from 50–150 m in the Arctic Ocean for five days in 1981. Oscillations in temperature are attributed to the vertical dispalcement of internal waves. The spectral shape of isotherm dispalcement is consistent with the Garrett-Munk model and other internal wave observations, but the spectral level is significantly lower. Other observations from the Arctic Ocean also exhibit lower internal-wave energy when compared with historical data from lower latitudes. The lower energy may be related to the unique generation and dissipation mechanisms present in the ice-covered Arctic Ocean. Significant peaks in vertical coherence occur at 0.81 and 2.6 cph. The peak at 2.6 cph coincides approximately with the high-frequency spectral cutoff near the local buoyancy frequency; this feature has been observed in many other internal wave experiments. The coherent oscillations at 0.81 cph exhibit a node in vertical dispalcement at 75–100 m. This is consistent with either the second, third or fourth vertical mode calculated from the mean buoyancy frequency profile. Evidence is presented which suggests that, contrary to the Garrett-Munk model, the frequency spectrum does not scale with the Coriolis parameter.